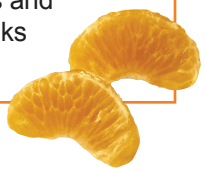
Harvest of the Month

Network for a Healthy California

Health and Learning Success Go Hand-in-Hand

The school environment plays an important role in feeding a child's body and mind and promoting lifelong healthy habits. Studies show that students who sample new foods in class first are more likely to try them in school meals. Use **Harvest of the Month** to introduce students to fruits and vegetables and promote daily physical activity. It connects with core curricula and links the classroom, cafeteria, home and community.



Exploring California Mandarins

Offering activities that allow students to experience mandarins using their senses may help increase interest, awareness and support for eating more fruits and vegetables.

Tools:

- One Satsuma, tangerine and tangelo variety* per group; harvest from school garden
- Paper and pencils
- One cutting board and knife per group

*See *What's in a Name?* on page 2 for varieties.

Sensory Exploration Activity:

- Divide class into groups of four
- Observe, feel and smell each variety
- Cut fruits into quarters; observe differences in skin
- Observe and record different tastes, colors, textures and shapes
- Discuss similarities and differences between varieties
- Report observations to class and note preference

Citrus fruits are sources of flavonoids (or bioflavonoids), known for their antioxidant properties and ability to increase levels of Vitamin C within the body's cells, positively affect blood flow and exhibit anti-allergy and anti-inflammatory effects.

For more information, visit: www.nal.usda.gov/fnic/foodcomp/Data/Flav/Flav02-1.pdf

For more ideas, reference:

Fruits and Vegetables Galore, USDA, 2004.

Nutrition Facts

Serving Size: 1 medium mandarin (88g)

Calories 47	Calories from Fat 2
	% Daily Value
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 2mg	0%
Total Carbohydrate 12g	4%
Dietary Fiber 2g	6%
Sugars 9g	
Protein 1g	

Vitamin A 12% Vitamin C 39% Calcium 3% Iron 1%

Source: **www.nutritiondata.com**

For nutrition information in bar graph format, visit the *Educators' Corner* at **www.harvestofthemonth.com**.

Cooking in Class: Tangerine Popsicles*

Ingredients:

Makes 70 mini-popsicles

- 35 large tangerines (50 medium)
- Ice trays
- Plastic wraps
- 70 toothpicks
- Hand juicers (optional)

Cut tangerines in half and juice into bowl using hand juicer or squeezing. (Scoop out any seeds from juice.) Pour juice into ice trays. Cover trays with plastic wrap. Insert toothpicks into middle of each cube. Let juice freeze. Serve mini-popsicles.

*For botanical investigation activities, visit the *Educators' Corner* at **www.harvestofthemonth.com**.

Adapted from: *Kids Cook Farm-Fresh Food,* CDE, 2002, pp. 74-75.

Reasons to Eat Mandarins

One medium mandarin provides:

- An excellent source of Vitamin C, which is an antioxidant. Antioxidants help prevent chemical damage to cells and can promote vision health, keep the immune system healthy, support cardiovascular health and help prevent cancer.
- A good source of Vitamin A, supporting healthy vision.
- A source of folic acid, a B-complex vitamin that can help prevent birth defects.

January Events

- **National Fiber Focus Month**
- **Healthy Weight Week**
- **National Fresh Squeezed Orange Juice Week**

CITRUS GALORE: MANDARINS

January

What's in a Name?

Pronunciation: măn'də-rĭn
Spanish name: mandarina
Family: Rutaceae
Genus: *Citrus*
Species: *Citrus reticulata*

The genus *Citrus* consists of three primordial species, one of which is the mandarin orange *(Citrus reticulata).** Mandarin oranges are not oranges *(Citrus sinensis),* and to avoid confusion are often referred to as simply "mandarins." The name "tangerine" is used to refer to mandarins of a deep, orange-red color and is derived from a mandarin cultivar that originated in Tangier, Morocco. While the two names are used interchangeably for commercial purposes, this is botanically incorrect.

There are different taxonomy systems in use to categorize the fruits within the *Citrus reticulata* species. The USDA adheres to the system which categorizes mandarins into three major cultivars (see chart).

Mandarin Cultivars	Marketed as	Popular California Grown Varieties of Cultivar
Common Mandarin	Mandarins and tangerines	Clementine, Honey, Sunburst, Dancy, Pixie
Satsumas	Satsuma or "Emerald Tangerine"	Kara, Owari, Silverhill (70 California varieties and 200 worldwide)
Mandarin Hybrids	Tangelos (tangerine-pomelo) and tangors (tangerine-orange)	Minneola tangelo, Sampson tangelo, Thornton tangelo, King tangor

*Implement *Science Investigation* activity on page 4 to help students learn about the three *Citrus* species.

For more information, visit:
http://citrusvariety.ucr.edu/citrus/mandarins.html
www.ers.usda.gov

Student Sleuths

1. Write a story describing the journey of a ripe citrus fruit from the farm to the consumer and how its nutrients are used in the human body.
2. What nutrients do citrus fruits provide and what are the levels recommended to help keep you healthy? Determine if you are getting these levels and, if not, make a plan to eat at least one citrus fruit each day.
3. According to the USDA, there are three main citrus species and many hybrid cultivars. What are the three main species? What are the hybrid cultivars and what species were crossed to create these hybrids? (See *Adventurous Activities* on page 4 for follow-up activity.)
4. How are seedless citrus fruit trees developed?

For information, visit:
www.cfaitc.org
http://ucce.ucdavis.edu

How Much Do I Need?

Recommended Daily Amounts of Fruits and Vegetables*

Kids, Ages 5-12	Teens, Ages 13-18	Adults, 19+
2½ - 5 cups per day	3½ - 6½ cups per day	3½ - 6½ cups per day

*Ranges take into account three activity levels: sedentary, moderately active and active. For example, active individuals should aim to eat the higher number of cups per day. Visit **www.mypyramid.gov** to learn more.

School Garden: Plant a Fruit Tree

Go beyond growing an orange tree from seed (*School Garden* activity from Cycle I). Plant a citrus or other fruit tree.* Consult a local nursery for help with selecting an appropriate fruit tree for your area.

Materials:

- Dwarf rootstock (e.g., citrus, apple, peach, pear, plum)
- 4' x 4' area in garden
- Compost or other soil amendment
- Mulch (e.g., straw, wood chips, compost)

*For instructions on how to plant a tree, visit the *Educators' Corner* at **www.harvestofthemonth.com**.

Adapted from: **www.lifelab.org**

For more ideas, visit:
www.garden.org
www.ecomagic.org/fruition

Why start a school garden? Experiments conducted in California schools have shown that students are more likely to choose fruits and vegetables offered in school meals when they have planted, grown and harvested them from an instructional garden.

Just the Facts

- There is no waste in the processing of citrus fruits. The juice is used for fresh juice and refined into wines, liquors, vinegars and syrups; the peel is used to make oils, marmalade, pectin and citric acid; and seeds are used to make oils.
- In 2005, about 68 percent of the nation's total citrus crop was processed (mainly for juice), but more than half of California's citrus crop was sold as fresh. California's dry climate allows for growth of fruits that are more aesthetically appealing.
- Satsumas were once the most popular mandarin variety but are second now to Clementines.
- California Clementines are available from mid-November to January leading to their nickname as "Christmas Oranges."

Sources:
http://ucce.ucdavis.edu
www.fas.usda.gov

A Slice of Mandarin History*

- **2,200 B.C.E.:** First known references to citrus fruits; the mandarin is native to southeastern Asia and the Philippines.
- **1840:** Willow-leaf and China mandarin varieties are imported by Italian consulate from Italy and planted in New Orleans; varieties later travel to Florida and then California by end of 19th century.
- **1882:** King mandarin variety is sent from Southeast Asia to University of California Citrus Research Center at Riverside (UC Riverside).
- **1914:** Clementines are introduced to California farmers after five years of study at UC Riverside.
- **1997:** Harsh winter in Florida devastates domestic orange production; opens booming market to California Clementines.

*Visit the *Educators' Corner* at **www.harvestofthemonth.com** for a more detailed timeline.

For more information, visit:
www.hort.purdue.edu/newcrop/morton/mandarin_orange.html

Home Grown Facts

- California leads production of fresh citrus and ranks second nationally (behind Florida) in total citrus production.
- California is the nation's second leading grower of mandarins and leads domestic production of Clementines.
- Of the 250,000 acres of citrus grown in California, about 10,500 acres are harvested for mandarins at total value of about $38.2 million.
- Leading counties of mandarin production are Tulare, Riverside, San Diego, Imperial and Ventura.
- Satsumas, Clementines and Minneola tangelos are the State's top three mandarin varieties.

2005 Data

For more information, visit:
www.cdfa.ca.gov
www.nass.usda.gov

Eat Your Colors

Fruits and vegetables come in a rainbow of colors. Eat a variety of colorful fruits and vegetables every day — red, yellow/orange, white, green and blue/purple. These may lower the risk of some cancers. Mandarins are in the yellow/orange color group.

Color Group	Health Benefits	Examples of Citrus Fruits
Yellow/ Orange	Help maintain heart health, vision health and healthy immune system	Mandarins*, pomelos, citrons, oranges, grapefruits, lemons, loquats, kumquats

*See *What's in a Name?* on page 2 for list of mandarin cultivars and common varieties.

For more information, visit:
www.fruitsandveggiesmatter.gov

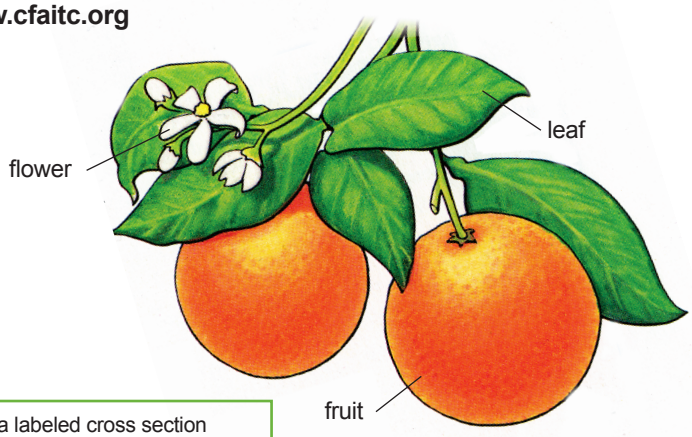
How Does Citrus Grow?

Citrus plants are large shrubs or small trees distinguished for their shiny, evergreen leaves and fragrant blossoms. The flowers produce a fruit known as a *hesperidium,* a berry with a leathery rind surrounding pulp-filled segments. Most citrus trees blossom two to five years after planting. Citrus fruits can be left on the tree without becoming overripe and do not continue to ripen after being picked.

	Citrus Trees	California Mandarins
Climate	Tropical and subtropical; most cannot tolerate freezing	Thrive in subtropical areas; most tolerant citrus tree; can withstand frost and drought*
Soil	Any type with good drainage or high air humidity	Tolerates low or high pH levels and salinity
Planting	Rows 10 to 20 feet apart; grow 16 to 50 feet tall	Rows about 10 feet apart; grow up to 25 feet
Propagation	Grafting or budding by rootstock	Same
Flowers	Light-colored, sweet scented blossoms; single flower contains both sexes	Same
Reproduction	Most are self-fertile; bees transfer pollen from male to female parts within flower	Self-fertile (common mandarin and hybrids) or parthenocarpic** (Satsuma)
Time from blossom to fruit	5 to 18 months	About 18 months
Harvest period	Year-round depending on locale (Northern or Southern Hemisphere)	October through May; Satsumas (early fall), common mandarins (winter), tangelos (late winter to spring)
Harvesting	Hand harvested (both processed and fresh)	Must be clipped, not pulled from tree

*Trees can withstand freezing, but fruits are easily damaged by cold.
**Parthenocarpic flowers do not require pollination.

For more information, visit:
http://aggie-horticulture.tamu.edu/citrus/mandarins.htm
www.cfaitc.org



For a labeled cross section of an orange, refer to Cycle I or download from **www.harvestofthemonth.com**.

Adapted from: *Tall and Tasty Fruit Trees,* Meredith Sayles Hughes, 2000.

Cafeteria Connections

Grades K–5:

- Get into the classroom by reading to students.
- Select a book from *Literature Links* on this page.
- Promote with teacher a follow-up student activity that complements book and supports literacy and/or nutrition skills, such as:
  - Ask students to draw themselves eating their favorite citrus fruit and list adjectives to describe fruit.
  - Display students' artwork on bulletin board in cafeteria.

Grades 6–12:

- Ask students to research and develop nutrition labels for several types of citrus fruits.
- Ask students to develop marketing messages that promote consumption of citrus on the school menu.
- Display students' creations in cafeteria.
- See *Literature Links* on this page for books to support students' research.

Adventurous Activities

Science Investigation:

As students will learn from the *Student Sleuths,* the USDA recognizes three species of the genus *Citrus:* the mandarin (*C. reticulata*), the citron (*C. medica*) and the pomelo (*C. maxima*). Within these species are dozens of sub-species, or cultivars, as well as natural and man-made hybrids. Common hybrids include the orange, grapefruit, lemon, lime and tangelo. Discuss the taxonomy system and how fruits and vegetables are botanically classified. Then have students complete the following activity:

- Work in groups of three to six students
- Develop a "new" citrus hybrid or other fruit
- Describe fruit characteristics (e.g., reproduction, growth, color, seeds, texture)
- Classify fruit according to characteristics (from Kingdom to Species)
- Present fruit and taxonomy chart to class

For more activities, visit:
www.harvestofthemonth.com

Student Advocates

- Color photographs have been shown to help increase school meal participation. Have students take photos of school meals and display on bulletin boards. Include nutrient analyses of meals and provide comparisons with lunches from home or other places.
- Have students identify ways to make a more walkable community. Work with school leaders and community members to begin implementation of the Safe Routes to School program. Visit **www.cawalktoschool.com** or **www.pbs.org/americaswalking** for more ideas.

Physical Activity Corner

Safe Routes to School National Partnership

In the past 30 years, the number of children who walk or bike to school has declined from over 50 percent to fewer than 15 percent. A new federal transportation bill has created a Safe Routes to School program. Visit the Web site below to learn more.

- Poll students on how they get to/from school (e.g., walk, bike, bus, carpool).
- Discuss factors that influence how they get to/from school (e.g., distance, parents, safety, lack of transportation).
- Determine what would need to change for students to walk or bike to/from school.
- Discuss ways the school community can start a Safe Routes program.*

*See *Student Advocates* activity above to encourage students to get started.

For more information, visit:
www.bikesbelong.org

Literature Links

- **Elementary:** *Harvest Year* by Cris Peterson, *What Grows from a Tree?* by Lola Schaefer and *Tangerine* by Colin Cheong.
- **Secondary:** *All About Citrus and Subtropical Fruits* by Maggie Klein, *Fruit Crate Art* by Joe Davidson and *Sell What You Sow* by Eric Gibson.

For more ideas, visit:
www.cfaitc.org/Bookshelf/Bookshelf.php

Next Month: Cabbages

CHAMPIONS for CHANGE
Network for a Healthy California

This material was funded by USDA's Food Stamp Program through the California Department of Public Health's *Network for a Healthy California*. These institutions are equal opportunity providers and employers. The Food Stamp Program provides nutrition assistance to people with low income. It can help buy nutritious foods for a better diet. For information on the Food Stamp Program, call 1-888-328-3483.